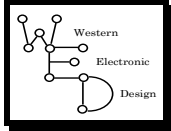




MAGAREY PLANT PATHOLOGY



# GrowCare Barossa



2013/14 V1 # 3

**Brought to you by your local Regional association**

This message was posted by 5 pm Friday 18<sup>th</sup> October 2013 and will be updated as necessary for best management of vineyard issues.

## Frost Damage

Freeze damage looks ugly and often is ugly.

The low temperatures of Monday night and Tuesday morning (14<sup>th</sup> -15<sup>th</sup> October) created a significant amount of damage in a number of vineyards, especially across the floor of the Valley around Ebenezer.

## Weather Stations

The data from the GrowCare weather stations showed that the temperatures at about 1.5m above soil level dropped to below 3°C from around 10pm on Monday night and warmed up beyond this only around 6am on Tuesday morning. The temperatures dropped below 1°C for about 2hrs at Craneford and for about 4hr at Ebenezer and Lyndoch but it was warmer at the Gomersal site – never going below 3°C at the GrowCare site.

## Why the Damage?

Frost (freeze) damage is usually caused when the temperatures drop to around -3°C to -4°C. The vascular fluid (the water) in the cells freezes at these temperatures. Frozen water expands and this ruptures the cells especially on soft green tissues like the young flowers and bunches. These tissues then rapidly disintegrate, blacken and die. It quickly looks dreadful!

Some varieties and vineyards are more affected than others. For instance, vines with tall grass in the vine-row radiate heat more quickly than a fallowed vineyard and so are more frost prone than a mowed vineyard or a cultivated patch.

Vines at or near flowering are very susceptible to frost damage and sadly, many vines were at this stage and suffered accordingly.

## Past Experience

In previous seasons when there has been a heavy frost, experiments with various remedial treatments have been conducted by the CSIRO and by Primary Industries. These treatments included selective spring-pruning of frozen (killed) shoots and cutting back/trimming of lesser-affected shoots. Efforts to trigger the development of secondary and tertiary buds (at the base of shoots) or of new buds on this season's green shoots, several leaves up the shoot, have also been evaluated.

The results have suggested that none of these efforts are cost effective in most vineyards, except



*Shoots killed. Freeze (frost) damage on soft young foliage in a badly affected vineyard in the Barossa Valley floor after the heavy frost on Monday night – Tuesday morning. Secondary and tertiary buds at the base of these shoots will soon produce new shoots and a low-yielding, delayed second crop. Photo: Nicki Robins.*

perhaps in vineyards with fruit for high priced markets. Even then, the value of the treatments was doubtful because, despite the extra inputs



*Shoots damaged with upper leaves, shoot tips and most bunches killed by the frost in the Barossa Valley on Monday night – Tuesday morning. Buds from low on the shoots will produce new shoot growth (and few fruitful buds) in about 10 days. Photo: Nicki Robins.*



*Shoots less damaged with some flower buds (inflorescences) damaged and some killed. As bad as they look, some of these shoots and young 'bunches' will survive and produce a crop – although, naturally enough, at reduced yield. Photo: Nicki Robins.*

(pruning costs), this season's yields are likely to be very low and at times, there may be two distinct maturity dates as the 'second crop' ripens later than remnant bunches from the present crop.

So, what do I do now?

### **Management Options**

As hard as it is, do nothing!

#### **For the Frost-damaged Foliage**

As said, the cost effectiveness of any spring pruning treatment is highly doubtful. New shoot growth will appear in 10-14 days from the frost (ie in the next week or so) depending on the vigour of the vines. The roots will be supplying a reduced canopy and this will lead to a surge in new growth from buds on surviving shoots and a new budburst from basal buds on shoots killed by the frost.

On moderately damaged vines, the foliage looks seriously affected now but by harvest, it might prove to be less serious than thought. Experience has shown that where bunches do survive, they will compensate for the killed bunches and often yield better than supposed at present.

In moderately affected vines, there will also be some new shoots from basal buds and as a result, a delayed second crop. The two stages of maturity are likely to interfere with harvest... but there is no treatment that can prevent this easily.

#### **Powdery Mildew on Frosted Vines**

All new shoot growth will be susceptible to diseases like powdery mildew. The frost will in effect, increase the spraying window for powdery as highly susceptible, new foliage growth will be present for longer.

In some vineyards (badly affected) it will be as though the spray season will be starting again – with a new budburst. Not an exciting thought!

Judge spray regimes and spray timing from the growth of new foliage in your vineyard. This will vary from patch to patch, depending on the variety, the severity of the frost damage and the vigour of the vines.

### **Powdery on Unfrosted Vines**

In surviving untouched canopies, the growing density of foliage means that effective spray coverage is increasingly hard to achieve.

Andy Landers from Cornell University recently pointed out at workshop in the Barossa, that there are many points where effective spraying is disrupted in vineyards. One point worth checking at this time of the season is the need to recalibrate the sprayer outputs to adjust for the expanding canopy volume.

### **What Spray Volume is Needed?**

A simple way to determine how much spray volume is needed uses the so-called 'unit canopy row' calculation. Not everyone thinks this is the best way but a simple outline will help you review its merits.

Let's suppose a canopy is 1 metre tall and 1 metre wide (too big for most Barossa vineyards), but let's also suppose this canopy extends 100 metres along the row. The volume of this canopy is calculated as 1m x 1m x 100m = 100 cubic metres.

Easy so far! Now, to spray this canopy effectively you will need to apply between 25-30 litres of spray volume to each 100 m of vine row.

But, suppose your vines are only 750 mm high and 500 mm wide. To spray these effectively, you will need to apply  $0.75 \times 0.5 \times 100 \times 30L = 675 \text{ L}$  of spray/100 m vine row. Or if the canopy is 250mm wide, the calculation is:

$0.75 \times 0.25 \times 100 \times 30L = 338L/100 \text{ m vine row.}$

### **Frosted or Not.**

Whether your vineyard has suffered from freeze damage or not, now is the time to check spray volumes to ensure excellent control of powdery mildew is achieved. A badly frosted patch will have a reduced canopy and a recalibration of your spray volume will be needed.

Either way, now is a good time to spray before the 'outside' (exposed) canopy becomes the 'inside' canopy and becomes difficult to spray effectively!

-----  
*This message has been prepared by  
 Barossa Grape and Wine in partnership with  
 Magarey Plant Pathology and Western Electronic  
 Design. It will be updated as soon as possible  
 after the next significant vineyard event*